REMARKS/ARGUMENTS

Applicant and his attorney appreciate the interview of 20 September 2005 granted by the Examiner and her supervisor, Milton Cano, wherein we discussed how the invention defines over the prior art and how to better prosecute claim language to reflect this fact. After the inventor explained the invention in detail and clarified the step of presetting and molding the edible protein thin film matrix prior to bonding, the Examiner suggested to limit the protein source to surimi to better define the claimed invention. Therefore, the present response/amendment is intended to incorporate those agreements reached between the applicant and the Office. In furtherance thereof, applicant offers the following commentary and arguments in support of patentability of the invention.

With respect to claim 1 and those claims dependent thereon, Devro Limited (WO 92/01394 (the '394 publication)) and Kojima *et al.* (JP 56137871A (the '871 patent)) are inapplicable as a basis for rejecting the claimed invention. The invention disclosed in the '394 publication is a collagen protein, ultra-thin film moisture barrier. As stated previously by the applicant, the publication states that "...the films of the invention are generally undetectable (whether visually or organoleptically) in the cooked products." Page 5, at lines 3-6. Thus, while there is no disclosure concerning the thickness of the films, one can infer that they are sufficiently thin so as to be generally undetectable. This inference is further bolstered by the fact that a hydrophobic coating applied to the film is only 0.0005" thick. Page 10, at lines 35-36. As a result, the disclosed moisture barrier film is intended to be overlooked by the consumer, and it appears to meet this objective.

Apparently conceding that the '394 publication lacks disclosure concerning comparatively thick films, the Examiner relies upon the '871 patent to establish the presence in the prior art of thicker films, *i.e.*, films in the range claimed applicant. However, the Examiner has failed to provide the necessary motivation for a skilled

practitioner to seek and incorporate the teachings of the '871 patent into the basic technology disclosed in the '394 publication.

As established above, the intended purpose of the thin film of the '394 publication is to be transparent to the consumer. For this reason, the invention of the '394 publication relies upon a collagen protein mixture (preferably from cattle skin or intestines) as opposed to that comprised of muscle tissue, since it is not feasible to obtain the required very thin film from a non-collagen protein mixture. A skilled practitioner in the edible moisture barrier arts would not be motivated to seek alternative film compositions that a) could not form the required thin film, or b) create thick films contrary to the objectives of the invention of the '394 publication as stated above and therein. Stated alternatively, why would a skilled practitioner seeking to create a thin film that is imperceptible to a consumer be motivated to seek alternative film compositions that can only form highly perceptible films, thus defeating the very objectives of the '394 technology? Furthermore, why would such a practitioner wish to create comparatively thick films in the first place? The answers to both of these questions is in the negative; a skilled practitioner would not be inclined to seek such comparatively thick films nor be inclined to increase the perceptibility of moisture barrier films. Thus, the combination advanced by the Examiner to reject the invention of claim 1 is improper and must be withdrawn.

While not advanced by the Examiner, given its lack of disclosure concerning the composition of the surimi, applicant also wishes to establish the inapplicability of Nakajima US 4670276 (the '276 patent) for any reason. The '276 patent concerns sheets of fully cured surimi used to make laminated sandwich-like foods. The intermediary film (that which is used just prior to formation of the final product) is fully heated and dried prior to subsequent usage. *See, e.g.*, the Abstract. Thus, the protein matrix in the surimi has been irreversibly modified to a fixed matrix state after heating and drying (much like the non-yolk portion of an egg), and no longer exhibits the same or similar degree of viscosity that an uncured intermediate film would. Because applicant's claim 1 requires a generally uncured intermediary film that is used as a

precursor to a final curing process, the '276 patent neither discloses nor teaches the use of such intermediary films; its films are not uncured.

With respect to claim 20 and those claims dependent thereon, Devro Limited (WO 92/01394 (the '394 publication)) and Kojima et al. (JP 56137871A (the '871 patent)) and Food Packaging Technology (FPT) are inapplicable as a basis for rejecting the claimed invention. Claim 20 differs from claim 1 in that it is directed to describing the nature of the joinder between two films comprising processed protein. As elucidated during applicant's interview with the Examiner, usage of the following terms and phrases, whose meanings are present in the specification, is neither incidental nor accidental: "preset film"; "joined"; "prior to and during subsequent curing". Through experimentation, it has been found that creation of a cavity or pocket from the intermediary films is optimized when an initial form is established, beginning with preset films. Once the films are set, and thus take on the form imparted by, for example, a mold, selected portions of each film can be joined to one another prior to and during a subsequent curing action to form the desired bonds. If the intermediary sheets were cured prior to the subsequent joinder, a bond could not be formed absent the use of some "glue" such as molten cheese, which applicant implicitly rejects. See, page 5, line 19 to page 6, line 3 in applicant's WO 03/034829 publication for background on these terms and phrases.

In view of the foregoing, applicant has been unable to identify any prior art reference that discloses or suggests a configurable protein matrix comprising two preset films that are selectively joined to each other, prior to any formal curing, in order to create a direct film-to-film bond during formal curing. The invention disclosed in the '276 patent relies upon a filler layer to effectuate a bond between two cured sheets of surimi. This is not what is claimed in applicant's claim 20. Moreover, the technology disclosed in the '276 patent teaches by omission that a surimi-to-surimi bond is not possible without such a filler layer. The Examiner's attempts to rely upon FPT to establish knowledge in the art concerning bonding of one film to another do not take into consideration the claimed limitations. However, simple heat and compression of a

cured film is not what applicant claims, nor are there any suggestions in this or other references supporting the Examiner's proposition. The fact remains that the bonds between the preset films are carefully created, and the means by which they are created are not disclosed or fairly taught in the prior art.

While not required by the prior art to establish patentability of the claimed invention, applicant has amended claim 20 to reflect the specific nature of the subject protein, namely that it is muscle protein (of which surimi is a species) that specifically excludes applicability of collagen protein.

With respect to amended claim 26, it should be clear that a proteinacious envelope defining an opening through which foodstuffs may be inserted patentably defines over the prior art of record for the reasons stated above. To clarify the nature of the envelope, applicant has amended this claim to require that at least a portion of the envelope comprises a film-to-film bond. Having established that a film-to-film bond of a high protein film material (> 50% protein by weight) must occur during the curing of the film, and having established the lack of such disclosure in the prior art of record, applicant submits that claim 26 and those dependent thereon patentably define over the prior art.

Errata:

In response to the Examiner's objection to the specification and rejection of claim 7 under 35 USC §112, applicant submits the reference Surimi and Surimi Seafood detailing the industry accepted methodology for characterizing "gel strength" or stiffness of surimi gels. In view of this reference, applicant submits that its measurement units are correct and respectfully requests the Examiner to withdraw her objection and rejection.

Respectfully submitted this 7th day of October, 2005.

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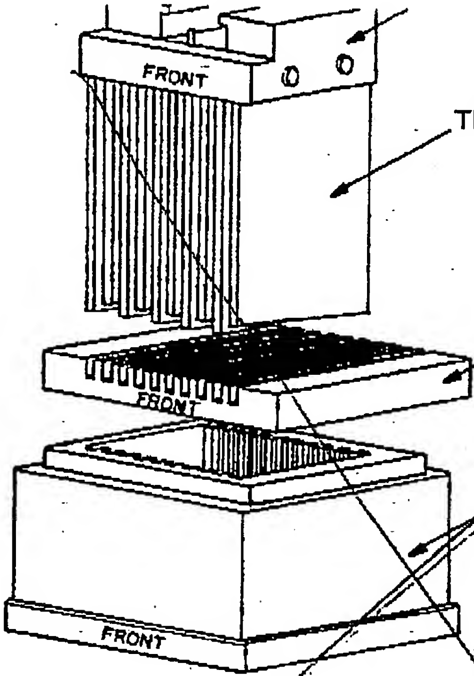


Figure 29 Kramer shear cell. (Courtesy of Food Technology Corp., Rockville, MD.)

and the test sample mass and area are large so the influence of local irregularities is reduced.

A. Punch (Penetration) Test

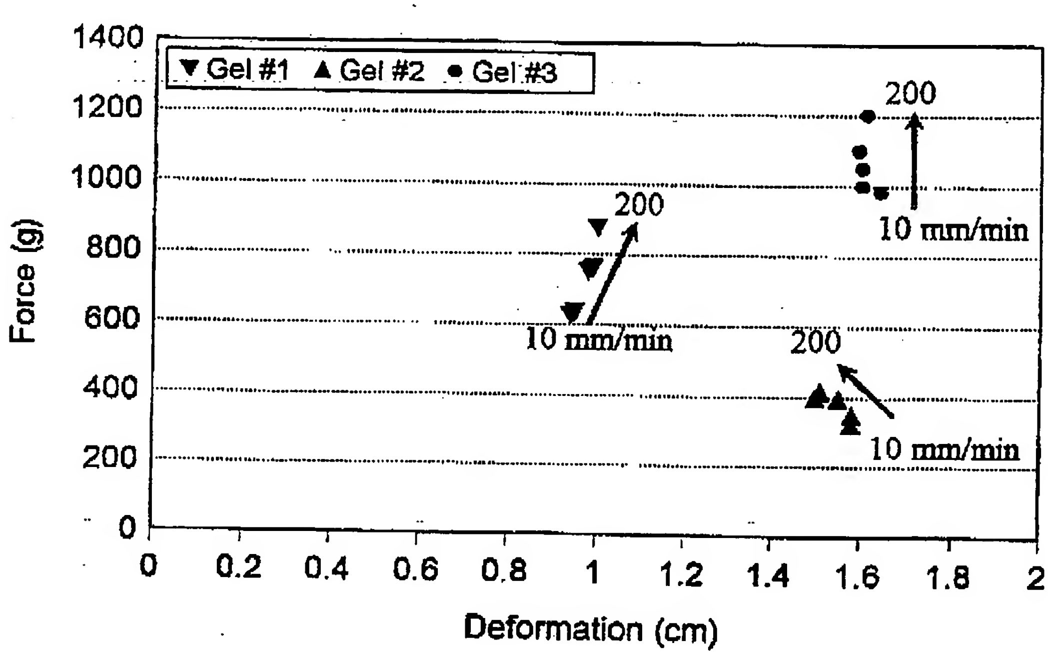
The punch test, although it is considered an empirical test, is the single most popular gel measurement technique used in the surimi industry for evaluating "gel strength" or stiffness. The punch test imitates the large deformations to failure involved in mastication. Many studies have been reported that correlate puncture methods with the sensory properties of surimi gels. This attribute of the test, coupled with its convenience, has made it popular for the quality control within the surimi industry.

The test was initially developed by Matsumoto and Arai (39) and later modified by Okada (40). The "Okada Gelometer" became the standard instrumental method used in the Japanese surimi industry. In this test, a punch probe of a specific diameter (3.0 mm) and length (25 mm) is used to compress the surface of a gel specimen at a constant deformation rate (10–60 mm/min) until puncture occurs. Many of the modern penetrometers used in industry operate at a fixed 60 mm/min and a 5.0-mm probe is commonly used.

The recorded peak force (F) at break and the depth of penetration are used to describe the gel properties. Often these two values are multiplied together to give the "jelly strength." The jelly strength is the value that is used in the Japanese grading standards. This type of measurement has been frequently used for surimi gel samples and offers a good correlation with attributes such as first-bite hardness.

Although it is very simple and most widely used for objective measurement within the surimi industry, several restrictions are given as follows:

1. For this test to be adequate, either the range of cohesiveness needs to be small enough that it is not considered an important sensory note, or the hardness and cohesiveness of the samples are related in a consistent way so they are not independent. This is often true if protein concentration, species, filler ingredients, and process variables are invariant. The cohesiveness of most surimi seafood varies significantly, depending on surimi quality, and the cohesiveness and hardness vary independently.
2. The punch is usually conducted using a sphere (5–30 mm diameter) driven by a small-diameter shaft at a speed of 10–60 mm/min. A change in test variables can lead to different results for the same sample. For instance, by increasing the downward speed of the probe (Fig. 30) and the size of the probe (Fig. 31), the puncture force for the sample increases.
3. Fracture property measurements of foods are much less reproducible than small deformation parameters, and a coefficient of variation (standard devia-



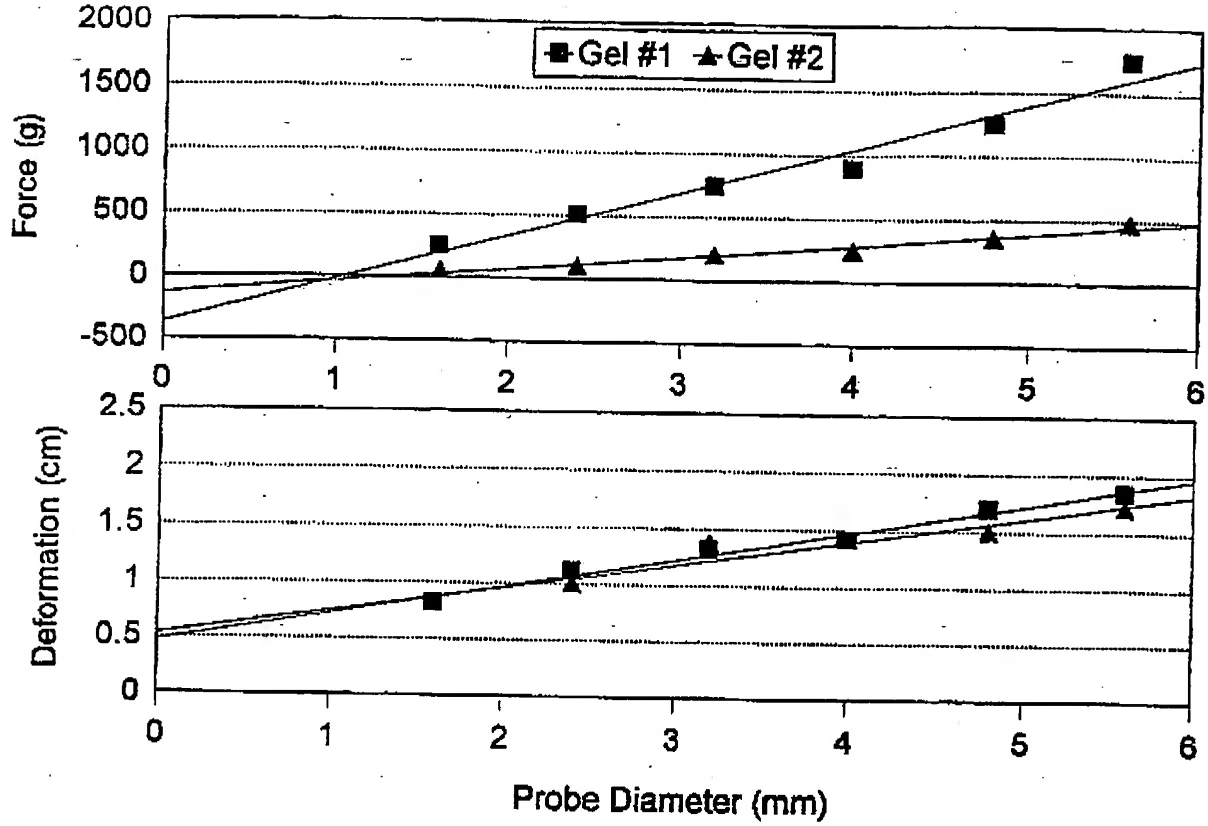


Figure 31 Effects of probe diameter on deformation values of gels. (Adapted from Ref. 5.)

tion of the mean) in the order of 10% is common. For the punch test, which measures gel properties at a point of penetration into the gel, coefficients of variation can be even higher because failure takes place at defects in the sample where the number and extent of such defects may vary from sample to sample. Usually, firmer gels show a higher trend for increased error in the force value. Vacuum chopping may be one option to improve the precision of the test.

4. The use of the term *gel strength*, which is often referred to as jelly strength in Japan, has misrepresented the quality of surimi. Gel strength calculated on the basis of the force multiplied by deformation using a unit of "g.cm" does not provide any significant meanings to the rheological properties of gels. However, it has been arbitrarily (perhaps wrongly) used in the surimi industry as a symbol of surimi quality. As illustrated in Figure 32, it is obvious that five different gels could have the same gel strength (960 g.cm), but the protein quality of the gels is significantly different. When located in a texture map based on force and deformation, they are extremely different. Therefore, if all surimi is equally priced, the purchase of surimi "E" would be ideally the best value because deformation indicates the quality of surimi proteins. Because force values depend on the quantity of proteins (inversely moisture), the purchase of surimi

Gels	Force (g)	Deformation (cm)	Gel Strength (g.cm)
A	960	1	960
B	800	1.2	960
C	600	1.6	960
D	400	2.4	960
E	320	3	960

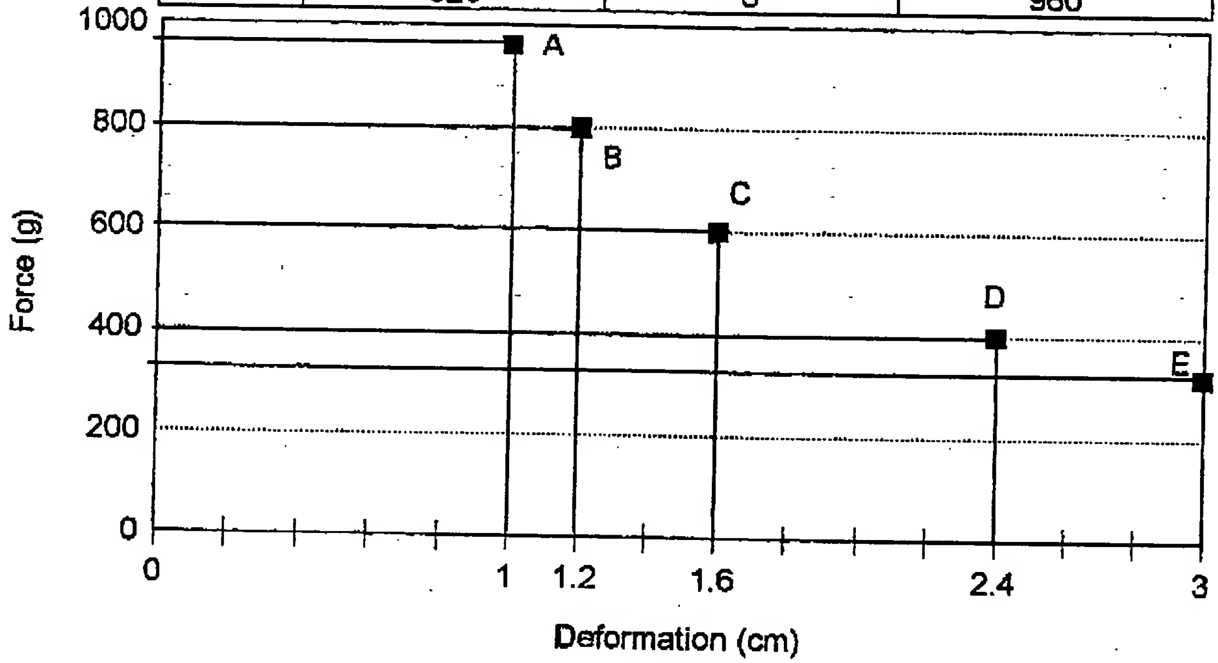


Figure 32 Five different surimi gels with the same gel strength (jelly strength).

"A" would give the least value. Therefore, force and deformation values must be expressed individually, not in the form of gel strength (or jelly strength, g.cm), to indicate the gel functionality of surimi.

B. Texture Profile Analysis

A group at the General Foods Corporation Technical Center pioneered the development of the texture profile analysis (TPA). Their test involved compressing a bite-size piece of food, a cube approximately 1 cm, to 25% of its original height (75% compression) two times in a reciprocating motion, which imitates the action of the human jaw. From the resulting force-time curve, a number of textural parameters that correlate well with the sensory evaluations of those parameters were extracted (1).

The TPA has been widely used for the empirical determination of a number of textural attributes of muscle foods and surimi gels. Texture profile analysis